EPA REGION 6
AIR INSPECTION REPORT

FRS #:	110000757752 Inspection Dates: **October 15-19, 2012**
AFS #:	48-201-00372 (VOPAK LOGISTICS SERVICES USA INC) and 48-201-00248 (VOPAK TERMINAL DEER PARK INC)
Type of inspection:	Clean Air Act, Partial Compliance Evaluation
Company Names:	**VOPAK LOGISTICS SERVICES USA INC** and **VOPAK TERMINAL DEER PARK INC**
Facility Names:	**VOPAK LOGISTICS SERVICES USA DEER PARK** and **VOPAK TERMINAL DEER PARK**
Physical Location:	2759 Independence Parkway South (also known as Battleground Road) Deer Park, Texas 77536
Mailing Address:	P.O. Box 897 Deer Park, Texas 77536-0897
County/Parish:	**Harris County**
Reg. Programs:	**SIP, Title V, MACT, NESHAP, and NSPS**
SIC Code:	4953 and 7699 (VOPAK LOGISTICS SERVICES USA INC) and 4226 and 4953 (VOPAK TERMINAL DEER PARK INC)

Sam Hoyt 3/27/2013

Facility Representatives:

Colin Scott	General Manager	281-604-6034
Clifton Ferrell	Environmental & Quality Manager	281-604-6094
Lisa Alford	Env. Specialist	281-604-6133
Duane Campbell, CIH, CSP	Safety Manager	281-604-6033
William List	Terminal Manager	281-604-6038
Geronimo Martinez	Wastewater System Supervisor	
Pam Smolen	Operations Engineer	
James Westberry	Wastewater/Deepwell Manager	

EPA Inspectors:

Daniel Hoyt	6EN-AS	Env. Engineer	214-665-7326
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Harris County Inspectors (Pollution Control Services Dept):

Kathy Porter	Compliance Coordinator	713-920-2831
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Enforcement Officer: Daniel Hoyt 3/21/13
Daniel Hoyt, Environmental Engineer (Date)

EPA Inspector: Daniel Hoyt 3/21/13
Daniel Hoyt, Environmental Engineer (Date)

Reviewed By: Margaret Osbourne 3/21/13
Margaret Osbourne, Environmental Scientist (Date)

Executive Summary:

This inspection report is comprised of four sections:

- **Section I – Introduction** includes the following topics:
  - purpose of the inspection,
  - facility description,
  - maps of the facility and detailed process descriptions (These are referenced in designated ATTACHMENTS.)
- **Section II – Observations**
- **Section III - Areas of Concern**. The issues stated in Section III in this report were identified during the time of this inspection and do not preclude any further enforcement document review, legal review or further enforcement action.

Section I - INTRODUCTION

PURPOSE OF THE INSPECTION

The inspection team, including me, EPA Region 6 inspector Daniel Hoyt; EPA Office of Enforcement and Compliance Assistance, Air Enforcement Division inspector Cary Secrest; and Harris County Pollution Control Services inspectors Kathy Porter and Matt Van Vleck arrived at the offices of Vopak Terminal Deer Park Inc.- Deer Park (Vopak Terminal) and Vopak Logistics Services USA Inc. -Deer Park (Vopak Logistics) at 8:30 am on October 15, 2012, for an unannounced inspection. We met with Colin Scott, General Manager, Gulf Coast Terminals of Vopak Logistics and Clifton Ferrell, Environmental & Quality Manager, Gulf Coast of Vopak Terminal at the Opening Conference. We were also introduced to Lisa Alford, Environmental Specialist for Vopak Terminal who was identified as our primary escort while conducting the field portion of the inspection; Duane Campbell, CIH, CSP, Safety Manager for Vopak Terminal; and James Westberry, who manages the Vopak Logistics Wastewater Treatment System and Deep Well Injection System.

Cary Secrest presented his credentials, and I presented my EPA identification to Mr. Scott. Cary Secrest informed Mr. Scott that this was an EPA inspection to determine compliance with the Clean Air Act (CAA). Cary explained that the scope of the inspection was a partial compliance evaluation (PCE) and included evaluation of the compliance of the facility with applicable CAA regulations, including Title V operating permit requirements and Texas State Implementation Plan (SIP) regulations. The objective was to systematically evaluate storage tanks and other sources using an infrared (IR) camera for optical gas imaging and photo-ionization detectors (PID), detecting and identifying emissions sources for further investigation.

The inspection was prompted by an analysis of stationary air monitoring data that I conducted, which indicated a significant air emissions source of benzene was located at or near the Vopak Deer Park facilities. EPA Region 6 issued a CAA Section 114 information request to Vopak Terminal, which was received by Vopak on September 17, 2012. The request and response, dated November 14, 2012 are included respectively as Attachment 4 and Attachment 5.

During the entry meeting Cary Secrest requested a tank inventory list (see Attachment 1) and plot plans (see Attachment 2), which Colin Scott provided. Mr. Scott provided an updated tank inventory list (included with Attachment 1) on October 16, 2012, which included tank capacity and vapor pressure of the material stored. Cary Secrest also informed Colin Scott that if any documents provided contain confidential business information (CBI), those documents should be marked as confidential. Duane

Campbell informed Cary Secrest and me that nothing out of the ordinary was scheduled at the Vopak Deer Park facilities for that day.

FACILITY DESCRIPTION

The facility is permitted by TCEQ as two separate regulated entities that are owned and operated by separate corporate entities under the common parent corporation Vopak North America Inc. (a subsidiary of Royal Vopak N.V., headquartered in the Netherlands). The Dun & Bradstreet reports and Texas Secretary of State corporation information for both regulated entities are included as Attachment 3. Vopak Logistics and the emissions sources at Vopak Terminal, which is a major source for volatile organic compounds (VOC), hazardous air pollutants (HAP) and nitrogen oxide emissions, are contiguous to each other and under common control.

- **Vopak Terminal**
  According to Collin Scott, the facility is a contract (for hire) liquid chemical storage terminal that operates 24 hours per day and currently employs 201 full-time employees. It has 242 tanks on site, four to seven of which may be out of service at any given time, storing up to approximately 110 different liquid products, including hydrocarbons, acids, alkali and glycols.

  Vopak Terminal employs four flare stacks, and the flares control the following sources, as described in the CAA Section 114 information request response: Flares FL-600 and FL-900 control emissions from tank truck and rail car loading activity. Flare TO-1M (identified as flare T-700 during the inspection, and FL-MARINE1 and FL-STYRENE1 in Attachment 5) and Flare TO-2M (identified as flare T-800 during the inspection, and FL-MARINE2 and FL-STYRENE2 in Attachment 5) control emissions from styrene tanks, and ship and barge loading.

- **Vopak Logistics**
  According to Clifton Ferrell, the facility operates 24 hours per day and currently employs seven full-time employees. The facility consists of a biological wastewater treatment unit and a deep well injection disposal unit. Mr. Ferrell stated that the wastewater facility does not receive any "benzene NESHAP regulated waste streams," that the wastewater facility receives contaminated storm water and tank maintenance related wastewater, and that some of the wastewater is trucked in from Vopak Terminal - Galena Park, an off-site facility. Previously, the facility had performed railroad tank car cleaning at the site, but Mr. Ferrell reported that Vopak had discontinued these operations several years ago and terminated the permit that authorized the activity.

  Vopak Logistics receives waste by vacuum truck or pipeline from Vopak Terminal locations and by tank truck from Vopak Terminal Galena Park. The trucks transfer the waste at the unloading rack to the Wastewater System if the waste is compatible with the Wastewater System, and otherwise to the Deepwell System.

  Wastewater System process: Vopak Logistics conveys all Wastewater System compatible waste via piping from sumps, tank trucks and vacuum trucks into the 01-T-569 Receipt Tank, a 5,000 barrel (bbl) open top tank. Material from the 01-T-569 Receipt Tank routes via piping to either the 01-T-570 Equalization Basin, the 01-T-571 Equalization Basin (both are 55,000 bbl open top tanks), or fixed roof Tanks 530 or 532. Vopak Logistics did not clearly explain how Tanks 530 and 532 are tied to the rest or the Wastewater Treatment System. Vopak Logistics alternates the function of the Equalization Basins, with one receiving waste from the 01-T-569 Receipt Tank for flow and composition equalization while the other sends wastewater via piping to the Floc Tanks. The Floc Tanks are three open-top rectangular basins where flocculent mixes with the waste stream. Then the wastewater flows via piping to the 01-C-5 IDAF which skims an oily hydrocarbon layer via a

dissolved air floatation process from the top using four skimmers and removes a sludge-like material from the bottom. The three separated streams from the 01-C-5 IDAF, including the oily hydrocarbon layer, the sludge-like material and remaining wastewater flow into an open sump with a walkway grate over it called the Dissolved Air Floatation (DAF) sump. The DAF sump has several compartments for the various streams. From the DAF Sump, the sludge and hydrocarbon layer flows via piping to a secondary digester, and the wastewater flows via piping to the 01-T-56 Aeration Basin. From the 01-T-56 Aeration Basin the wastewater is piped to the open top 01-C-7 Clarifier, then through a filter and then it flows to an outfall on the Houston Ship Channel.

James Westberry provided a Disposal Overview area plot plan document and Deepwell System process flow diagram (see Attachment 13) on October 15, 2012. Mr. Westberry updated the Deepwell System process flow diagram by putting an "X" over "Clarifier 05-C-1 thru 05-C-4", "EOTS 05-574/575" and "Centrifuge 05-T-43/44 05-V-2", stating that these sources have been out of service for approximately six years, when Vopak discontinued operating as a third party wastewater service (see area of concern No. 1). EOTS is an acronym for Emulsion Oil Treatment System. Mr. Westberry also clarified to me on October 15, 2012 that although the Disposal Overview area plot plan document indicates that the 01-T-571 Equalization Basin is an aeration basin, it has not been aerated for approximately six years. Also, the 01-C-8 API Separator and 01-C-9A/B Digestor have been out of service for approximately four years, but are used as needed such as to handle excess volumes of storm water.

Section II – OBSERVATIONS

This section is organized by plant area/source type for sources and areas that were identified during the PID/IR camera survey. Certain emissions points were not reviewed, including various tanks and Flares 600 and 900. Cary and I selected the largest storage tanks storing materials with the highest VOC vapor pressure to conduct IR camera observations. I documented times and locations in the text below where PID concentration data was elevated. Data are identified as elevated based on comparison to the PID concentration data upwind, prior to and following the data identified as elevated. Video and image files referenced below, a spreadsheet file with all PID data collected during the inspection (vopak PID Master File 10 15 to 10 19 2012), and a summary spreadsheet file (Master Log of Data Vopak) are included on two compact disks as Attachment 8. A photo log is also included as Attachment 9, presenting each photo that was taken during the course of the inspection.

Cary Secrest and I conducted emissions surveys using the following equipment:

- IR camera manufactured by FLIR, Model GF320, Serial Number 4444009966. Optical gas imaging, IR camera surveys of emissions sources were each conducted first in high sensitivity mode (HSM) for screening purposes, and then in full automatic mode (auto). Tanks with emissions visible using the IR camera in both HSM and auto were identified for follow up, so that additional information can be requested.
- PID manufactured by Ion Science, PhoCheck Tiger, Serial Number T-106291 with a 10.6 eV lamp. This PID was calibrated with isobutylene, and is capable of detecting VOC as low as 1 ppb, depending on the gas.
- PID manufactured by Ion Science, PhoCheck Tiger Select, Serial Number T-106544, 10.6 eV lamp. This PID's lamp is equipped with a 10.0 eV glass filter that reduces the lamp output to 10.0 eV. This PID can be operated with a pre-filter tube to detect benzene-specific emissions. This PID was calibrated with benzene and is capable of detecting benzene as low as 10 ppb.

The PID calibration records for the most recent calibration prior to the inspection, as well as the records for the post-inspection calibration check, are included as Attachment 10. PID and FLIR camera time log was checked each morning prior to equipment operation.

The following table summarizes the locations of PID/IR camera surveys conducted each day of the inspection:

Dates	Locations
October 15, 2012	Wastewater Area
October 16, 2012	Wastewater Area 400 Tanks Area
October 17, 2012	600 Tanks Area 500 Tanks Area 700 Tanks Area 900 Tanks Area
October 18, 2012	Tank 411 P-Pit Area 900 Tanks Area T-700 and T-800 Marine Flares
October 19, 2012	Wastewater Area T-700 and T-800 Marine Flares

We conducted a briefing meeting (see Attachment 11 for attendees) at the end of each day except October 15 to review inspection observations. We provided the PID data, videos, and images recorded during the inspection to Clifton Ferrell of Vopak during these briefings. Attachment 11 provides the daily briefing dates, and the names of Vopak, EPA and Harris County representatives who attended.

Attachment 12 summarizes all emissions point observations, including IR camera survey results associated with this investigation, and certain storage tank information, including information for tanks that were not observed, for comparative purposes.

VOPAK LOGISTICS EMISSIONS POINT REVIEW

I observed that the 01-C-8 API Separator and 01-C-9A/B Digestor were out of service during the inspection. The 01-C-8 API Separator, the 01-C-9A/B Digestor, the 05-T-43 Batch Feed Tank and Centrifuge, the 05-T-44 Wastewater Receipt Tank from Centrifuge, the 05-T-574 EOTS, and the 05-T-575 EOTS, are listed by Special Condition (SC) 14 of Texas Commission on Environmental Quality (TCEQ) Permit 87923 as part of the Wastewater System but were all out of service, and according to James Westberry, have been out of service for several years. Wastewater System emissions sources that are not listed on the permit were observed, including the DAF Sump and Floc Tanks. The 05-T-43 Batch Feed Tank and Centrifuge, and the 05-T-44 Wastewater Receipt Tank from Centrifuge are also listed by SC 18 of the permit as part of the Deepwell System.

On October 15, 2012 the 01-C-8 API Separator and 01-C-9A/B Digestor were empty, although both open basins had dark oily hydrocarbon residual deposits and liquids/water on the sides/bottom. I observed that both PIDs detected VOC concentrations when they were placed above the out of service 01-C-8 API Separator at approximately 14:42 on October 15, 2012, with Tiger PID 15-second average readings up to 0.40 ppm VOC as isobutylene and Tiger Select PID without benzene selective tube, 15-second average readings up to 0.40 ppm VOC as benzene.

Mr. Westberry described the wastewater sampling that occurs at Vopak Logistics, stating that the wastewater system final effluent is tested bi-weekly for total organics and quarterly for toxicity. Mr. Westberry mentioned that he is currently trying out a new lab by giving them some samples to analyze to see how they perform. SC 23 of TCEQ Permit 87923 requires Vopak Logistics to sample the incoming wastewater at least quarterly for speciation of the materials listed in Attachment 1 of the permit, and use the sample results and Water 9 to estimate emissions. During a December 19, 2012 phone conversation with Clifton Ferrell, Lisa Alford and James Westberry of Vopak, with Debbie Ford, myself (Daniel Hoyt) and Virginia Sorrell of EPA, Clifton Ferrell stated that samples of the incoming wastewater are not routinely collected. During the December 19, 2012 phone conversation Lisa Alford stated that the emissions estimates from the Wastewater System are not based on sampling but conservative assumptions from the permit application.

I observed the wastewater system operating with approximately 145 gpm of wastewater flow from the 01-T-571 Equalization Basin to the Floc Tanks, based on information provided by James Westberry and the flow meter located at the 01-T-571 Equalization Basin at 14:45 on October 15, 2012 and 10:30 on October 16, 2012.

I reviewed historical imagery of the Wastewater System, and the three aerial images noted below show that both equalization basins contain visible hydrocarbon layers (see area of concern No. 4):

- Early 2010 aerial image (see Attachment 14) from the US Geological Survey (USGS) Earth Explorer data system (http://earthexplorer.usgs.gov/), with visible hydrocarbon layers in the 01-T-570 Equalization Basin and the 01-T-571 Equalization Basin
- Early 2011 aerial image (see Attachment 15) from Bing Maps (http://www.bing.com/maps/)

- Unknown date: aerial image (see Attachment 16) from Bing Maps (http://www.bing.com/maps/).

Water and air samples from the wastewater system (see Attachments 18 and 19) indicate the separated hydrocarbon layer includes VOC materials with true VOC vapor pressures greater than 0.5 psia, including moderately water soluble to practically insoluble in water VOC, such as acrylonitrile, methyl tert-butyl ether (MTBE), ethyl ter-butyl ether (ETBE), benzene, toluene and methyl isobutyl ketone (MIBK).

Cary Secrest and I conducted field observations in the Wastewater System area on October 15, 2012 (11:30 to 12:25 and 13:40 to 15:30), October 16, 2012 (9:45 to 12:00) and October 19, 2012 (9:50 to 12:00). Winds were 1.5 to 2.0 meters per second (m/s) with some calms, from the northeast (30 to 60 degrees) on October 15, 2012, at approximately 11:10. Winds were 1.8 to 2.5 m/s, from the northeast (30 to 60 degrees) on October 15, 2012, at approximately 13:30. Winds were 0.7 m/s, from the northeast (60 degrees) on October 16, 2012, at approximately 9:30. Winds were 1.5 m/s, from the east-northeast (70 degrees) on October 16, 2012, at approximately 13:20. Winds were 1.5 to 2.5 m/s, from the north (0 degrees) with clear skies on October 19, 2012, at approximately 8:55.

The allowable Wastewater System contaminants are identified by Attachment 1 of TCEQ Permit 87923. SC 5 prohibits Wastewater Systems tanks from storing chemicals not listed in Attachment 1 of TCEQ Air Permit No. 87923. New chemicals can be emitted from the Wastewater System at quantities greater than 0.04 lbs/hr if the emissions satisfy the Chemical Flexibility Special Conditions (equation in SC 10), and documentation is maintained as described by SC 23.C. Tanks may store new materials by either 30 Texas Administrative Code (TAC) §106 (Permit by Rule) or 30 TAC §116 (permit amendment), or as prescribed in the Chemical Flexibility Special Conditions. Wastewater emissions and liquids sampling results (Attachments 18 and 19) indicate the following compounds are emitted by the wastewater system, and are not included in Attachment 1 of TCEQ Air Permit No. 87923: Tetrahydrofuran (THF), 1,3-butadiene, acrylonitrile, ETBE, 1,3,5-trimethylbenzene and o-dichlorobenzene.

01-T-569 Receipt Tank Inspection Observations

The Wastewater System begins with the 01-T-569 Receipt Tank. On October 15, 2012 at approximately 14:20, Cary Secrest climbed the tank and observed a dark, oily substance in the tank. He used the Tiger PID and verified VOC emissions of approximately 80-100 ppm VOC as isobutylene, 15-second averaging, coming from the tank. Cary reported that the liquid level in the tank was near the bottom. James Westberry reported that the level gage indicated the tank level was 2 feet 4 inches at the time.

I observed that both PIDs detected elevated concentrations downwind from the 01-T-569 Receipt Tank at approximately 10:22 on October 19, 2012, with Tiger PID 15-second average readings up to 30 ppm VOC as isobutylene and Tiger Select PID with benzene selective tube 15-second average readings up to 20 ppm as benzene. Cary and I observed a vacuum truck delivery at 9:54 and detected a mild odor at the same time. Geronimo Martinez informed us that the vacuum truck was unloading into the 01-T-569 Receipt Tank, and he provided the disposal work order (EM No. 02-21) and manifest (UPDP 37752) associated with the load (see Attachment 17). The work order and manifest indicate the unloading occurred from 9:46 until 10:00, that the product was 15,480 lbs of storm water from "pits and pans in plant" transported by Chem Clean Truck LVT101, containing 10 mg/L phenol, with a specific gravity of 1.000, a pH of 7.50 and a 2,000 mg/L chemical oxygen demand (COD). Harris County Flood Warning System rain gauge data (http://harriscountyfws.org/) near Deer Park, Texas indicates total rainfall was less than 0.36 inches from October 1, 2012 to October 19, 2012.

Photos 3 and 4 depict the unloading rack at approximately 11:37 and 10:19 respectively on October 19, 2012. Per statements made by Mr. Martinez on October 19, 2012, Photo 3 shows a vacuum truck unloading waste to the 01-T-569 Receipt Tank and a tank truck from the Vopak Terminal Galena Park

unloading waste to the Deepwell System. Cary detected emissions from Tank 569 with the IR camera in HSM and auto during surveys on October 15, 2012 (see MOV_0444, MOV_446 and MOV_447) and October 19, 2012 (see MOV_0486 and MOV_0488).

01-T-571 and 01-T-570 Equalization Basin Inspection Observations

James Westberry of Vopak Logistics stated that the Floc Tanks of the wastewater treatment system were being fed at a rate of approximately 145 gallons per minute (gpm) from the 01-T-571 Equalization Basin and contents of the 01-T-570 Equalization Basin were not being fed to the wastewater system during the inspection. Anthony Tomlinson of Harris County and Vopak Logistics' contractors collected water samples at 10:34 until 10:40 on October 16, 2012 from the 01-T-571 Equalization Basin effluent. I observed that both PIDs detected VOC concentrations when placed near the sample collection bucket at approximately 10:39, with Tiger PID 15-second average readings up to 0.37 ppm VOC as isobutylene and Tiger Select PID with benzene selective tube, 15-second average readings up to 0.24 ppm as benzene. The Harris County water sample results, included as Attachment 18, did not pass quality assurance requirements and were rejected (data unusable), but the analysis did confirm that the sample contained ppm levels of MTBE and THF.

Floc Tanks Inspection Observations

Anthony Tomlinson of Harris County and Vopak Logistics contractors collected water samples from the Floc Tanks effluent (which flows to the 01-C-5 IDAF) at 10:46 until 10:50 on October 16, 2012. I placed both PIDs near the sample collection bucket (which was also above the DAF Sump) and I observed that the Tiger PID detected elevated concentrations at approximately 10:47, with Tiger PID 15-second average readings up to 1.80 ppm VOC as isobutylene. I also noted breakthrough for the Tiger Select PID benzene selective tube as evidenced by a color change, so the tube was replaced at 10:50. The Harris County water sample results did not pass quality assurance requirements and were rejected (data unusable), but the analysis did confirm that the sample contained ppm levels of MTBE and THF.

01-C-5 IDAF Inspection Observations

I observed that both PIDs detected elevated concentrations when they were placed above the 01-C-5 IDAF at approximately 12:03 on October 15, 2012, with Tiger PID 15-second average readings up to 1.92 ppm VOC as isobutylene and Tiger Select PID without benzene selective tube, 15-second average readings up to 2.33 ppm VOC as benzene. I also observed that the Tiger PID detected elevated concentrations when it was placed above the 01-C-5 IDAF at approximately 10:20 on October 16, 2012, with Tiger PID 15-second average readings up to 6.29 ppm VOC as isobutylene (the Tiger Select PID readings, with benzene selective tube had 15-second average readings up to 0.40 ppm as benzene at the time). I had replaced the benzene selective tube at 10:16.

I used the Tiger PID above the 01-C-5 IDAF near the location where an air canister sample was planned to be collected and the PID detected elevated concentrations at approximately 10:56 on October 16, 2012, with Tiger PID 15-second average readings up to 7.07 ppm VOC as isobutylene. Cary collected an air canister sample (Canister 5014) from the headspace above the 01-C-5 IDAF at 11:02. The air canister sample analysis (see Attachment 19) indicates the headspace above the 01-C-5 IDAF contained, among other VOC detected at lower levels, 1.37 ppm MTBE, 1.04 ppm ETBE, 0.139 ppm benzene, 0.166 ppm MIBK, 0.129 ppm ethylbenzene, and 0.099 ppm m/p-xylene.

I observed that the Tiger PID detected elevated concentrations at approximately 10:51 on October 19, 2012, when I placed it above the 01-C-5 IDAF near the location where an air canister sample was planned to be collected , with Tiger PID 15-second average readings up to 1.71 ppm VOC as isobutylene and

Tiger Select PID with benzene selective tube, 15-second average readings up to 0.01 ppm as benzene. The benzene selective tube was replaced at 10:08 and Tiger Select PID was zeroed at 10:47 to address positive offset. Cary collected an air canister sample (Canister 5041) from the headspace above the 01-C-5 IDAF at 10:53. The sample analysis (see Attachment 19) indicates the headspace above the 01-C-5 IDAF contained, among other VOC detected at lower levels, 0.43 ppm MTBE, 0.36 ppm ETBE, 0.028 ppm benzene, 0.044 ppm MIBK, and 0.024 ppm m/p-xylene.

DAF Sump Inspection Observations

I observed that both PIDs detected elevated concentrations when they were placed above the DAF Sump over the water chamber on October 15, 2012 at approximately 12:07, with Tiger PID 15-second average readings up to 4.52 ppm VOC as isobutylene and Tiger Select PID without benzene selective tube, 15-second average readings up to 3.49 ppm VOC as benzene.

I installed a new benzene selective tube on the Tiger Select PID at approximately 12:10 on October 15, 2012. I observed that both PIDs detected elevated concentrations when they were placed above the DAF Sump again (on sump grate above water chamber) at approximately 12:19, with Tiger PID 15-second average readings up to 23.1 ppm VOC as isobutylene and Tiger Select PID with benzene selective tube, 15-second average readings up to 1.30 ppm as benzene. I noted that the Tiger Select PID had a positive offset at 12:17 of approximately 0.53 ppm, so the above noted 1.30 ppm Tiger Select 15-second average reading should be adjusted down to approximately 0.8 ppm benzene. I noticed that the PID concentration readings were highest when a DAF Sump pump began running, moving material from the 01-C-5 IDAF into the DAF Sump.

I installed a new benzene selective tube on the Tiger Select PID at approximately 15:23 on October 15, 2012. I observed that both PIDs detected elevated concentrations when they were placed above the DAF Sump again (on sump grate above water chamber) at approximately 15:28, with Tiger PID 15-second average readings up to 55.3 ppm VOC as isobutylene and Tiger Select PID with benzene selective tube, 15-second average readings up to 1.70 ppm as benzene. I noted that the Tiger Select PID had a positive offset at 15:25 of approximately 0.315 ppm, so the above noted 1.70 ppm Tiger Select 15-second average reading should be adjusted down to approximately 1.40 ppm benzene. I noticed that the PID concentration readings were highest when a DAF Sump pump began running, moving material from the 01-C-5 IDAF into the DAF Sump.

I observed that the Tiger PID detected elevated concentrations when it was placed above the DAF Sump at approximately 11:17 on October 16, 2012 (above water chamber), with Tiger PID 15-second average readings up to 36.3 ppm VOC as isobutylene (Tiger Select PID with benzene selective tube, 15-second average readings were up to 0.23 ppm as benzene at the time). I noticed that the PID concentration readings were highest when a DAF Sump pump began running, moving material from the 01-C-5 IDAF into the DAF Sump. Cary collected an air canister sample (Canister 5026) from the headspace above the DAF Sump at 11:20 on October 16, 2012. The air canister sample analysis indicates the headspace above the DAF Sump contained, among other VOC detected at lower levels, 3.30 ppm MTBE, 3.16 ppm ETBE, 0.668 ppm benzene, 0.673 ppm MIBK, 0.091 ppm toluene, 0.291 ppm ethylbenzene, and 0.207 ppm m/p-xylene.

Anthony Tomlinson of Harris County and Vopak Logistics contractors collected water samples from the DAF Sump at 11:20 until 11:26 on October 16, 2012. The Harris County water sample results did not pass quality assurance requirements and were rejected (data unusable), but the analysis did confirm that the sample contained ppm levels of MTBE and THF.

I observed that the Tiger PID detected elevated concentrations when it was placed above the DAF Sump at approximately 11:08 on October 19, 2012 (above water chamber), with Tiger PID 15-second average readings up to 31.4 ppm VOC as isobutylene (Tiger Select PID with benzene selective tube, 15-second average readings were up to 0.37 ppm as benzene at the time). I noticed that the PID concentration readings were highest when a DAF Sump pump began running, moving material from the 01-C-5 IDAF into the DAF Sump. Cary collected an air canister sample (Canister 5044) from the headspace above the DAF Sump at 11:08 on October 19, 2012. The sample analysis (see Attachment 19) indicates the headspace above the DAF Sump contained, among other VOC detected at lower levels, 4.50 ppm MTBE, 3.67 ppm ETBE, 0.203 ppm benzene, 0.134 ppm MIBK, and 0.101 ppm m/p-xylene.

01-T-56 Aeration Basin Inspection Observations

I observed that the 01-T-56 Aeration Basin has a geodesic type dome with approximately four or five large openings, approximately four feet wide and high (see Photo 5). From these openings I saw the wastewater turbulently roiling from the aerator action.

I observed that the Tiger PID detected elevated concentrations when it was placed in the 01-T-56 Aeration Basin vent (geodesic type dome opening) over the wastewater headspace at approximately 14:06 on October 15, 2012, with Tiger PID 15-second average readings up to 25.9 ppm VOC as isobutylene. I observed that the Tiger PID detected elevated concentrations when it was placed in the 01-T-56 Aeration Basin vent (geodesic type dome opening) over the wastewater headspace at approximately 11:38 on October 16, 2012, with Tiger PID 15-second average readings up to 36.4 ppm VOC as isobutylene.

Cary collected an air canister sample (Canister 5035) from the 01-T-56 Aeration Basin vent (geodesic type dome opening) over the wastewater headspace at 11:39 on October 16, 2012. The sample analysis (see Attachment 19) indicates the headspace above the 01-T-56 Aeration Basin contained, among other VOC detected at lower levels, 9.04 ppm MTBE, 7.43 ppm ETBE, 0.113 ppm benzene, 0.125 ppm ethylbenzene, and 0.078 ppm m/p-xylene.

I observed that the Tiger PID detected elevated concentrations when it was placed in the 01-T-56 Aeration Basin south vent (geodesic type dome opening) over the wastewater headspace at approximately 11:22 on October 19, 2012, with Tiger PID 15-second average readings up to 21.5 ppm VOC as isobutylene. An air canister sample (Canister 5055) was collected from the 01-T-56 Aeration Basin south vent (geodesic type dome opening) over the wastewater headspace at 11:23. The air canister sample analysis (see Attachment 19) indicates the 01-T-56 Aeration Basin south vent (geodesic type dome opening) wastewater headspace contained, among other VOC detected at lower levels, 9.81 ppm MTBE, 6.29 ppm ETBE, 0.035 ppm benzene and 0.022 ppm m/p-xylene.

I conducted a PID survey upwind from the wastewater system on October 19, 2012 along the Vopak fence line, north of the wastewater system. I observed that the Tiger PID 15-second average readings were up to 0.09 ppm VOC as isobutylene and Tiger Select PID with benzene selective tube, 15-second average readings up to 0.13 ppm as benzene.

Cary collected an air canister sample (Canister 5056) upwind from the wastewater system along the Vopak fence line, north of the wastewater system at 11:44. The sample analysis (see Attachment 19) indicates the upwind ambient air from the wastewater system contained, among other VOC detected at lower levels, 0.43 ppm MTBE, 0.36 ppm ETBE, 0.028 ppm benzene, 0.044 ppm MIBK and 0.024 ppm m/p-xylene.

VOPAK TERMINAL EMISSIONS POINT REVIEW

MARINE FLARES TO-1M AND TO-2M

Per information provided by Pam Smolen, Vopak Operations Engineer on October 18, 2012: The TO-1M flare system has multiple burners sharing a common stack, including the FL-STYRENE1 burner that controls emissions from styrene tanks T-784, T-787, T-791, T-792 and T-793 and the FL-MARINE1 burner that control emissions from ship and barge loading. The TO-2M flare system also has multiple burners sharing a common stack, including the FL-STYRENE2 burner that controls emissions from styrene tanks T-784, T-787, T-791, T-792 and T-793, and the FL-MARINE2 burner that control emissions from ship and barge loading.

Ms. Smolen explained that the emissions from the styrene tanks alternate between FL-STYRENE1 to FL-STYRENE2 approximately each week, and that emissions from barge/ship loading alternate between FL-MARINE1 to FL-MARINE2 on the same schedule, such that one flare stack is never controlling both the styrene tanks and ship/barge loading emissions at the same time. Ms. Smolen also mentioned that the TO-1M flare system has a dedicated propylene oxide burner that is used for ship/barge loading emissions when propylene oxide is being loaded. Ms. Smolen indicated that flare systems are air assisted and equipped with one or more air blowers, and the blowers are not adjusted, that they are usually run "wide open." Ms. Smolen also stated that during ship and barge loading, waste gases from the loading activity are metered and sufficient natural gas is added to the waste gas to maintain the required BTU content prior to combusting it in one of the flare systems, assuming the waste gas has no appreciable heat content prior to adding the natural gas. Photo 6 depicts TO-1M in the background and TO-2M in the foreground.

Cary Secrest and I conducted field observations of the TO-1M and TO-2M flare systems on October 18, 2012 (11:15 to 12:00 and 13:00 to 15:10) and October 19, 2012 (14:10 to 14:50). Winds were 5 to 7 m/s, from the northeast (30 degrees) with overcast skies on October 18, 2012, at approximately 9:29. Winds were 5 m/s, from the north-northeast (20 degrees) with partly cloudy skies on October 18, 2012, at approximately 12:56. Winds were light and northerly on October 19, 2012 with clear skies, at approximately 14:05.

TO-1M (FL-STYRENE1, FL-MARINE1 and T-700) Inspection Observations

Cary Secrest detected emissions from the TO-1M flare system with the IR camera in auto during a survey at approximately 11:25 on October 18, 2012. The recorded video shows that the detected emissions plume extended as far as four or five stack diameters away from TO-1M flare stack (see MOV_0475, (11:25) looking north). Cary noted that the IR camera temperature readings for the plume apparent temperatures were similar to the sky background apparent temperatures, indicating the detected plume was VOC.

Photo 7 shows the TO-1M flare panel. I observed that the information displayed on the panel indicated that at approximately 13:40 on October 18, 2012 approximately 80 standard cubic feet per minute (scfm) of waste gas from the styrene tanks was being fed to the FL-STYRENE1 burner, before adding natural gas to ensure adequate waste gas heat content. Photo 8 shows the TO-1M panel name plate, indicating the panel was manufactured by IT McGill, with the following markings: PNL-400, 220072, McGill Pollution Control Systems Inc, 918-445-2431. I observed that the panel had three flame indicator lights, one for BSL-301, one for BSL-302 and one for BSL-303.

Cary detected emissions from the TO-1M flare system with the IR camera in auto during surveys at approximately 13:53 and 13:58 on October 18, 2012. The recorded videos show that the detected emissions plume extended as far as four or five stack diameters away from TO-1M flare stack (see MOV_0481 (13:53), looking north and MOV_0482 (13:58), looking east). Cary noted that the IR camera

temperature readings for the plume apparent temperatures were similar to the sky background apparent temperatures, indicating the detected plume was VOC.

Cary detected emissions from the TO-1M flare system with the IR camera in auto during a survey at approximately 14:21 on October 19, 2012. The recorded video shows that the detected emissions plume extended as far as four or five stack diameters away from TO-1M flare stack (see MOV_0493 (14:21), looking north). Cary noted that the IR camera temperature readings for the plume apparent temperatures were similar to the sky background apparent temperatures, indicating the detected plume was VOC.

TO-2M (FL-STYRENE2, FL-MARINE2 and T-800) Inspection Observations

Cary Secrest detected emissions from the TO-2M flare system with the IR camera in auto during surveys at approximately 11:18 and 11:29 on October 18, 2012. The recorded videos show that the detected emissions plume extended above and beyond Tanks 927 and 928, which are located across 11th Street from TO-2M (see MOV_0474 (11:18), looking north and MOV_0476 (11:29), looking northeast). Cary noted that the IR camera temperature readings for the plume apparent temperatures were similar to the sky background apparent temperatures, indicating the detected plume was VOC.

Cary Secrest climbed Tanks 927 and 928 at approximately 11:38 on October 18, 2012 and used the Tiger PID to verify VOC emissions from TO-2M that were detected with the IR camera extending over the noted tanks. The recorded PID data indicates that the 15-second average Tiger PID readings at the top of the tanks were as high as 2.7 ppm VOC as isobutylene, indicating the detected plume from TO-2M contained VOC. Attachment 20 is an aerial image from the USGS Earth Explorer data system captured in early calendar year 2010 showing the orientation of Tanks 927 and 928, 11th Street and the TO-1M and TO-2M marine flare stacks, with respect to the wind direction on October 18, 2012 at approximately 11:30. The aerial image shows that Tanks 927 and 928 were downwind from the TO-2M marine flare stack.

Photo 9 shows the TO-2M flare panel on October 18, 2012. I observed that the panel had four flame indicator lights, one for "First Stage", one for "Second Stage-A", one for "Second Stage-B" and one for "Propylene Oxide", indicating that the TO-2M flare system may have a dedicated propylene oxide burner used for ship/barge loading emissions when propylene oxide is being loaded. Photo 10 shows the TO-2M panel name plate, indicating the panel was manufactured by John Zink Co, with the following markings: CE-1, 922526.

Cary and I viewed the TO-2M flare system monitoring data on a computer screen at the Vopak Terminal Marine Control Room on October 18, 2012. The on-duty operator indicated that the TO-2M flare system was currently controlling waste gas from ETBE loading activity, and that the loading activity began October 17, 2012, and will continue all day on October 18, 2012. Permit 466A requires use of a flare for control of emissions during ETBE ship loading, with the loading rate not to exceed 15,000 bbl/hr. The computer screen data indicated that at 14:21: TE-804 was measuring a temperature of 498.8 degrees F, and FT-130B was measuring a flow rate of approximately 580 scfm of loading vapor waste gas (prior to natural gas addition). At 14:38: natural gas was being added at a rate of approximately 240 scfm with the natural gas valve was open 38%, temperature was 537.6 degrees F and the waste gas flow rate was 638 scfm. Cary and I observed the location where natural gas is added to the waste gas at the No. 2 Ship Dock. The natural gas pressure gauge indicated the natural gas line was at a pressure of 40 psi.

Cary Secrest climbed Tanks 927 and 928 at approximately 15:05 on October 18, 2012 and used both PIDs to verify VOC emissions from TO-2M that were detected with the IR camera extending over the noted tanks. The recorded PID data indicates that the 15-second average Tiger PID readings at the top of the tanks were as high as 3.98 ppm VOC as isobutylene and that the Tiger Select PID without benzene

selective tube, had 15-second average readings up to 3.75 ppm VOC as benzene, indicating the detected plume from TO-2M contained VOC. See Attachment 20 again for the orientation of Tanks 927 and 928, 11th Street and the TO-1M and TO-2M marine flare stacks, with respect to the wind direction on October 18, 2012 at approximately 15:00. The aerial image shows that Tanks 927 and 928 were downwind from the TO-2M marine flare stack.

I detected emissions from the TO-2M flare system with the IR camera in auto during a survey at approximately 15:07 on October 18, 2012, while Cary was climbing Tanks 927 and 928. The recorded video shows the detected emissions plume extended above and beyond Tanks 927 and 928, which are located across 11th Street from TO-2M (MOV_0483 (15:07), looking east).

Cary detected emissions from the TO-2M flare system with the IR camera in auto during surveys at approximately 14:16, 14:18 and 14:24 on October 19, 2012. The recorded video shows the detected emissions plume extended above and beyond Tanks 927 and 928, which are located across 11th Street from TO-2M (see MOV_0491 (14:16), looking northeast, see MOV_0492 (14:18), looking northeast and MOV_0494 (14:24) looking northeast). Cary noted that the IR camera temperature readings for the plume apparent temperatures were similar to the sky background apparent temperatures, indicating the detected plume was VOC.

400 TANKS AREA EMISSIONS POINT REVIEW

During the IR camera and PID surveys in the 400 Tanks Area, Cary Secrest noted on October 16, 2012 at 15:38 that Tanks 403 through 411 have flattened areas along the walls of the tanks and are not smooth/round. Clifton Ferrell noted on October 16, 2012 that some internal floating roof (IFR) tanks may have more emissions at Vopak Terminal when compared with other similar tanks, because Vopak Terminal is in the process of changing out old foam IFR tank seals with more efficient mechanical shoe type seals.

Cary Secrest and I conducted inspection observations in the 400 Tanks Area on October 16, 2012 (13:40 to 15:20) and October 18, 2012 (9:40 to 9:55). Winds were 1.5 m/s, from the east-northeast (70 degrees) with overcast skies, on October 16, 2012, at approximately 13:20. Winds were 5 to 7 m/s, from the northeast (30 degrees) with overcast skies, on October 18, 2012, at approximately 9:30.

On October 17, 2012 Clifton Ferrell provided a document, included as Attachment 21, which documents that Tank 411 was being drawn down on October 16, 2012 for tank truck loading from 13:22 until 14:19. Tank truck STAR 50134 was the referenced truck ID. On October 18, 2012 at approximately 9:30 Clifton Ferrell indicated that Tank 411 was still scheduled to be drawn down on October 18, 2012 at a rate of approximately 20 tank trucks per day. However, no documentation was provided by Vopak Terminal to verify what activity, if any, was occurring at Tank 411 during the 9:47 IR camera survey.

On October 17, 2012 Clifton Ferrell stated that there was no activity on October 16, 2012 involving filling or drawing down of Tanks 403, 404, 405, 406, 407, 408, 410. Cary detected emissions from Tanks 403 (see MOV_0454), 404 (see MOV_0453), 405 (see MOV_0455), 407 (see MOV_0457 and MOV_458), 408 (see MOV_0450, MOV_0451 and MOV_0452), 410 (see MOV_0449), and 411(see MOV_0448) with the IR camera in HSM and auto during surveys on October 16, 2012.

600 TANKS AREA EMISSIONS POINT REVIEW

Cary Secrest and I conducted inspection observations in the 600 Tanks Area on October 17, 2012 (9:15 to 10:10 and 13:45 to 14:25). Winds were 3 to 4 m/s, no calm periods, from the south (180 degrees), on October 17, 2012, at approximately 8:45. Winds were 3 to 4 m/s, from the southwest, on October 17,

2012, at approximately 12:10. Tanks in the 600 Tanks Area with low VOC vapor pressures or that were out of service, including Tanks 604 (Caustic Soda), 605 (Biodiesel, B99), 607 (out of service), 609 (Caustic Soda), 610 (Caustic Soda), 613 (Alpha Olefins, C10, 1-Decene, VOC vapor pressure 0.03 psi), 614 (Exxal 8, VOC vapor pressure 0.02 psi) and 615 (Biodiesel B 100) were not surveyed with the IR camera or PIDs.

I observed that PID concentrations were elevated at ground level downwind from Tank 602 on October 17, 2012 at approximately 9:22, with Tiger PID 15-second average readings up to 2.7 ppm VOC as isobutylene and Tiger Select PID, without benzene selective tube, 15-second average readings up to 1.6 ppm VOC as benzene. Cary initially detected emissions with the IR camera, also from ground level, but Cary was unable to identify the specific vent or vents that were emitting from ground level. The vents on Tank 602 are located on the top of the tank. Cary Secrest and I climbed this tank with Ron Sears of Vopak, who brought a flame ionization detector (FID) with him. Mr. Sears reported that his FID detected elevated concentrations on the top of the tank at the same time PID concentration readings were also elevated. I observed that the Tiger Select PID concentrations without benzene selective tube were elevated on top of Tank 602, downwind from a roof vent at approximately 9:30 on October 17, 2012, with 15-second average readings up to 15.1 ppm VOC as benzene (Tiger PID 15-second average readings were up to 0.25 ppm VOC as isobutylene at the time). Cary detected emissions from two vents on the roof of Tank 602 with the IR camera in HSM and auto during a survey on October 17, 2012 at approximately 9:35 (see MOV_0460). The vents were observed emitting intermittently indicating that this tank may be equipped with a nitrogen blanket to prevent air intrusion and potential oxidation of the product.

Cary detected emissions from Tanks 601 (see MOV_0461), 602 (see MOV_0460) and 606 (see MOV_0465) with the IR camera in HSM and auto during a survey on October 17, 2012. At approximately 10:20 on October 17, 2012 while traveling on 1st Street in a Vopak vehicle, I noticed a portable thermal oxidizer connected to Tank 603. Cary conducted an IR camera survey and I conducted a PID survey around the portable thermal oxidizer. I observed that the PID concentration readings were not elevated and the Cary confirmed based on IR Camera imaging that the portable thermal oxidizer was not operating during the survey.

500 TANKS AREA EMISSIONS POINT REVIEW

Cary Secrest and I were unable to conduct IR camera and PID surveys in the area around Tanks 500 through 504 on October 17, 2012 at approximately 10:30 because there was caution tape across High Road. Cary and I noted a vacuum truck and portable thermal oxidizer were on High Road near Tank 503, in the area the inspection team was unable to access because of the caution tape. Cary and I made another attempt to conduct IR camera and PID surveys in the area around Tanks 500 through 504 on October 18, 2012 at approximately 10:00, but we were unable to conduct the survey in that area because of VOC emissions that were detected coming from the P-Pit (see P-Pit Emissions Point Review, P-Pit Inspection Observations, and areas of concern Nos. 12, 13 and 14 below for more information about the P-Pit area).

Cary and I conducted inspection observations in the 500 Tanks Area on October 17, 2012 (10:25 to 11:05 and 12:50 to 13:45). Winds were 3 to 4 m/s, no calm periods, from the south (180 degrees), on October 17, 2012, at approximately 8:45. Winds were 3 to 4 m/s, from the southwest, on October 17, 2012, at approximately 12:10. Cary detected emissions from Tank 520 with the IR camera in HSM and auto during a survey on October 17, 2012 at approximately 13:27 (see MOV_0464).

700 TANKS AREA EMISSIONS POINT REVIEW

Cay Secrest and I conducted inspection observations in the 700 Tanks Area on October 17, 2012 (14:50 to 15:30). Winds were 3 to 4 m/s, from the southwest, on October 17, 2012, at approximately 12:10. Cary

detected emissions from one vent on Tanks 720 (see MOV_0466) and 721 (see MOV_0467) with the IR camera in HSM and auto during a survey on October 17, 2012.

900 TANKS AREA EMISSIONS POINT REVIEW

Cary Secrest and I conducted inspection observations in the 900 Tanks Area on October 17, 2012 (15:50 to 16:09) and October 18, 2012 (10:30 to 11:10). Winds were 3 to 4 m/s, from the southwest, on October 17, 2012, at approximately 12:10. Winds were 5 to 7 m/s, from the northeast (30 degrees), on October 18, 2012, at approximately 8:49.

Clifton Ferrell confirmed that the tank vents on Tank 918 are conservation vents on the roof of the tank. Mr. Ferrell stated on October 18, 2012 at approximately 10:40 that this tank and others that store reactive products such as olefins and propylene oxide have nitrogen blankets. A nitrogen blanket can be identified on tanks at Vopak Terminal by the presence of orange piping leading to the roof of the tank. Mr. Ferrell said that the conservation vents and nitrogen blankets are used to minimize the amount of air entering a tank because oxygen in the air can cause problems with the product in the tank. Orange piping was also observed leading to the roof of Tank 917, indicating that the tank is equipped with a nitrogen blanket and conservation vents. Tank 917 had insulation that prevented an estimate of the tank level during the survey.

I observed that the PID concentration readings were elevated at ground level downwind from Tank 918 at approximately 10:36, with Tiger PID 15-second average readings up to 0.49 ppm VOC as isobutylene and Tiger Select PID, without benzene selective tube, 15-second average readings up to 1.8 ppm VOC as benzene. Cary detected emissions from Tank 918 with the IR camera in HSM and auto during a survey on October 18, 2012 at approximately 10:44 (see MOV_0473). During the survey the PID and IR camera data indicated that the tank was venting periodically from the roof, once every nine minutes with each venting episode lasting approximately three seconds.

P-PIT AREA EMISSIONS POINT REVIEW

The plot plans provided depict pipeways adjacent to tank areas, which are used to transport liquid products to and from Vopak Terminal's tanks and the various ship, barge, rail car and tank truck loading stations. The plot plans depict locations along the pipeways that are denoted with a single letter. These locations are identified by signs and Vopak Terminal personnel as "pits", and the pits provide access to the pipeway piping and associated equipment for maintenance activity, including activities associated with removing residual product in the piping whenever a change in service in necessary, to prevent cross contamination of the different products.

Cary Secrest and I conducted inspection observations near the P-Pit Area on October 17, 2012 (10:28 to 10:32) and October 18, 2012 (9:59 to 10:20). Winds were 3 to 4 m/s, no calm period, from the south (180 degrees), on October 17, 2012 at approximately 8:45. Winds were 3 to 4 m/s, from the southwest, on October 17, 2012, at approximately 12:10. Winds were 5 to 7 m/s, from the northeast (30 degrees), on October 18, 2012, at approximately 8:49.

The P-Pit is located along a pipeway, across High Road and just east of Tank 503. Cary Secrest and I were attempting to conduct IR camera and PID surveys in the vicinity of Tanks 500 through 504 at approximately 10:30 on October 17, 2012. We were unable to access to the area around these tanks because of caution tape that extended across High Road. We observed a vacuum truck and portable thermal oxidizer on the other side of the caution tape, approximately 100 feet south of the caution tape, on High Road near P-Pit and Tank 503. I observed that PID concentration readings were elevated at ground level downwind from Tank 505 at approximately 10:30 on October 17, 2012, with Tiger PID 15-second

average readings up to 1.3 ppm VOC as isobutylene and Tiger Select PID, without benzene selective tube, 15-second average readings up to 1.1 ppm VOC as benzene. However, Cary detected no emissions from Tank 505 with the IR camera during the survey and the tank inventory list provided indicates this tank was out of service. The location downwind from Tank 505 was also downwind from the vacuum truck and portable thermal oxidizer that were noted on High Road near Tank 503 and P-Pit during the survey.

Cary Secrest and I attempted again to conduct IR camera and PID surveys in the vicinity of Tanks 500 through 504 at approximately 10:00 on October 18, 2012. We crossed High Road and as we began our PID survey upwind of Tank 501, I noticed that the PID concentration readings were elevated, with Tiger PID 15-second average readings up to 37.23 ppm VOC as isobutylene and Tiger Select PID, without benzene selective tube, 15-second average readings up to 46.95 ppm VOC as benzene. Attachment 22 is an aerial image from the USGS Earth Explorer data system captured in early calendar year 2010 showing the orientation of Tank 501, 503, High Road and the P-Pit, with respect to the wind direction on October 18, 2012 at approximately 10:00. The aerial image shows that the position upwind from Tank 501 was downwind from the P-Pit area.

Cary Secrest and I, along with our escort Clifton Ferrell immediately backtracked to get out of the plume that was detected by the PIDs. Cary Secrest used the IR camera from a crosswind location to determine that the emissions detected by the PIDs were coming from the P-Pit. Cary detected emissions from the P-Pit with the IR camera in HSM and auto during a survey at approximately 10:44 (see MOV_0470). Photo 11 shows a picture of the P-Pit, looking north, including two open ended 18 inch pipes without any cap, blind flange, plug, or valves.

Clifton Ferrell stated, based on radio conversations he had at approximately 10:15, that the line was being purged with nitrogen and that the line previously contained MTBE. During the daily briefing on October 18, 2012, Clifton Ferrell further explained that the line was being cleaned, that it was cleared and tested the day before using vapor recovery and a portable thermal oxidizer, and that on October 18, 2012 when emissions from the P-Pit were detected with the PIDs and IR camera, that the line was being purged with nitrogen. Mr. Ferrell reported that the purging was immediately discontinued after the emissions were detected with the PIDs and IR camera. Cary Secrest requested documentation from Vopak Terminal describing what happened, such as a root cause analysis, at approximately 10:20 on October 18, 2012, and again during the daily briefing on October 18, 2012. A Marine Pipeline Activity Query report dated October 17, 2012 was provided by Vopak Terminal and is included as Attachment 22.

Section III - AREAS OF CONCERN

1. Vopak Logistics Services USA Inc is not operating the emission sources as represented by Permit 87923.
   - The Wastewater System has numerous uncovered components, open to the atmosphere and emitting volatile organic compounds (VOC) and hazardous air pollutants (HAP), including:
     - 01-T-569 Receipt Tank
     - 01-T-570 and 01-T-571 Equalization Basins
     - Floc Tanks
     - 01-C-5 IDAF Dissolved Air Flotation (DAF)
     - DAF Sump
     - 01-T-56 Aeration Basin
   - Various permitted Wastewater System and Deepwell System components are not in service and the Floc Tanks and DAF sump are not authorized as emissions sources in the permit.
   - Vopak Logistics Services USA Inc is not conducting quarterly Wastewater System sampling for VOC speciation.
   - Vopak Logistics Services USA Inc is not estimating emissions from the Wastewater System based upon sampling.
   - Vopak Logistics Services USA Inc is processing/treating compounds not authorized in Attachment 1 of the permit.
   - Infrared (IR) camera imaging of the 01-T-569 Receipt Tank, photo-ionization detector (PID) monitoring throughout the Wastewater System area and analyses of water/air samples of various Wastewater System components collected during the inspection do not appear to be consistent with the permit hourly VOC and benzene emissions limitations for the Wastewater System.

2. Vopak Logistics Services USA Inc is contiguous to Vopak Terminal Deer Park Inc, a major source of HAP, and both sites are under common control. Vopak Logistics Services USA Inc accepts and treats waste from one or more offsite facilities. The site may therefore have applicable control requirements under 40 CFR Part 63, Subpart DD, National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery.

3. Vopak Logistics Services USA Inc's Wastewater System may require control equipment if the facility has an affected VOC wastewater stream as defined in 30 TAC §115.140. The determination regarding affected VOC wastewater stream could not be made because the facility is not measuring influent flow rates and concentrations prior to exposing the wastewater stream to the atmosphere in the open top 01-T-569 Receipt Tank, the first component of the Wastewater Treatment System.

4. Vopak Logistics Services USA Inc separates hydrocarbon and aqueous phases of wastewater via gravity in Wastewater System open top tanks, including the 01-T-569 Receipt Tank and 01-T-570 and 01-T-571 Equalization Basins. 30 TAC §115. 132(a) requires control for VOC/Water Separation in the Houston/Galveston area that separate VOC with true partial pressures greater than 0.5 psia.

5. Vopak Logistics Services USA Inc's operations are not authorized by a Title V Federal Operating Permit (FOP). However, Vopak Logistics Services USA Inc and Vopak Terminal Deer Park Inc are contiguous and under common control, and Vopak Terminal Deer Park Inc is a major source of HAP, VOC and nitrogen oxides (NOx), authorized for operation by FOP O-01068.

6. Vopak Terminal Deer Park Inc emissions from TO-1M (FL-700) and TO-2M (FL-800) Marine Flares may exceed the VOC emissions limits and permit application representations of Permit 466A.

7. Vopak Terminal Deer Park Inc may not operate the TO-1M (FL-700) and TO-2M (FL-800) Marine Flares properly, or in a manner consistent with good air pollution control, as required by 30 TAC §116.615(9) (Standard Permits – General Conditions – Maintenance of Emission Control). The Marine Flares control emissions from styrene storage tanks T-784, T-787, T-791, T-792 and T-793 authorized by TCEQ Standard Air Permit No. 80015.

8. Vopak Terminal Deer Park Inc's TO-1M (FL-700) and TO-2M (FL-800) Marine Flares may not reduce benzene loading emissions by 98% as required by 40 CFR §61.302(b) (NESHAP Subpart BB – National Emission Standard for Benzene Emissions from Benzene Transfer Operations).

9. Vopak Terminal Deer Park Inc's TO-1M (FL-700) and TO-2M (FL-800) Marine Flares may not reduce VOC emissions at a 90% control efficiency as required by 30 TAC §115.212(a)(6)(A) for VOC loading at marine terminals in the Houston/Galveston area.

10. Vopak Terminal Deer Park Inc emissions from ship/barge loading emissions controlled by TO-1M (FL-700) and TO-2M (FL-800) Marine Flares may exceed the major source threshold for HAPs. As a major source, the facility is subject to the control requirements of 40 CFR Part 63, Subpart Y (National Emission Standards for Marine Tank Vessel Loading Operations). This is not an applicable requirement in Vopak Terminal Deer Park Inc's FOP O-01068.

11. Vopak Terminal Deer Park Inc emissions from Tanks 403, 404, 405, 407, 408, 410, 411, 520, 601, 602, 606, 720, 721 and 918 may exceed the VOC limits or permit application representations of Permit 466A.

12. On October 18, 2012 Vopak Terminal Deer Park Inc emitted methyl-tert-butyl ether (MTBE) from a pipe or pipes in the P-Pit area during maintenance activities that are not consistent with any TCEQ emissions authorization or otherwise subject to an affirmative defense under 30 TAC §101.222.

13. On October 18, 2012 Vopak Terminal Deer Park Inc vented uncontrolled VOC emissions from a pipe or pipes in the P-Pit area during planned maintenance activities. 30 TAC §115.122 requires control of VOC vent gas emissions.

14. On October 18, 2012 Vopak Terminal Deer Park Inc vented MTBE at ground level from a pipe or pipes in the P-Pit area across an open roadway during maintenance activities. MTBE exposure is associated with chronic and acute human health effects, and MTBE is flammable, a listed HAP, and a listed hazardous substance under Section 112 of the Clean Air Act (CAA). Venting MTBE at ground level without monitoring emissions or limiting access of personnel and vehicles to the area is a failure to design, maintain and operate a stationary source in a safe manner, as required by CAA §112(r)(1).

15. Vopak Terminal Deer Park Inc modified Tanks 606, 561, 513, 520, 535, 536, 764, 786 and 790 according to Attachment 5. The modification may have resulted in applicability to 40 CFR Part 60, Subpart Kb. FOP No. O-01068 does not indicate that the tanks are subject to NSPS Subpart Kb.

16. Vopak Logistics Services USA Inc's Permit 87923 and Vopak Terminal Deer Park Inc's Permit 466A both identify, authorize operation of, and establish emissions limitations for Tanks 584, 585, 589 and 590.

17. Vopak Logistics Services USA Inc's Permit 87923 authorizes operation of the Wastewater Treatment System. The facility operates Tank 530 as part of the Wastewater Treatment system, but TCEQ Permit 466A, issued to Vopak Terminal Deer Park Inc, authorizes operations and establishes emissions limitations for Tank 530.

Attachments

1. Tank Inventory Lists provided October 15 and 16, 2012
2. Site Plot Plans
3. Dun & Bradstreet Reports and Texas Secretary of State Corporation Information
4. CAA Section 114 Information Request dated August 24, 2012
5. Vopak Terminal Response to CAA Section 114 Information Request dated November 14, 2012
6. TCEQ Permit 87923, issued to Vopak Logistics Services USA Inc., May 3, 2011
7. TCEQ Permit 466A, issued to Vopak Terminal Deer Park Inc., December 20, 2011
8. Two Compact Disks with Video and Image Files, Spreadsheet File with all PID data collected during the inspection (vopak PID Master File 10 15 to 10 19 2012), and a summary spreadsheet file (Master Log of Data Vopak)
9. Photo Log – 11 photos taken October 15-19, 2012
10. PID Calibration Records
11. Daily Briefing Dates and Attendees
12. Vopak Inspection Observations Summary Table (Master Log)
13. Disposal Area Plot Plan and Deepwell System Flow Diagram
14. Wastewater System Aerial Image, USGS, captured 2010
15. Wastewater System Aerial Image, Bing, captured 2011
16. Wastewater System Birds Eye View, Bing, unknown capture date
17. Disposal Work Order EM No. 20-21 and Manifest UPDP 37752
18. Harris County Liquid Samples Analyses Results Reports
19. Air Canister Samples Analyses Reports
20. TO-1M and TO-2M Marine Flare Stacks Area Aerial Image, USGS captured 2010
21. Vopak Terminal Tank Truck Activity Report Provided on October 17, 2012
22. P-Pit Area Aerial Image, USGS captured 2010
23. Vopak Terminal Marine Pipeline Activity Query Report Dated October 17, 2012